

Lady Parts: The Metaphysics of Pregnancy

ELSELIJN KINGMA

Abstract

What is the metaphysical relationship between the fetus/embryo and the pregnant organism? In this paper I apply a substance metaphysics view developed by Barry Smith and Berit Brogaard to argue, on the basis of topological connectedness, that fetuses/embryos are Lady-Parts: part of the maternal organism up until birth. This leaves two options. Either mammalian organisms begin at birth, or we revise our conception of organisms such that mammalian organisms can be part of other mammals. The first option has some advantages: it is numerically neat; aligns with an intuitive picture of organisms as physically distinct individuals; and ties 'coming into existence' to a suitably recognisable and important event: birth. But it denies that the fetus survives birth, or that human organisms existed prior to their birth. The second option allows us to recognise that human organisms exist prior to and survive their birth, but at a cost: it leaves the question of when an organism comes into existence unanswered, and demands potentially far-reaching conceptual revision across a range of domains.

Introduction

I take these two statements to be uncontroversial: (1) before an organism becomes pregnant, it is only one organism. (2) after the organism's pregnancy, there are (usually) at least two organisms. Together, these statements raise a question: when does one organism become two?

In phrasing this question as I do, I wish to emphasise two things. First, I present what is usually seen as 'zero to one' or 'coming into existence' problem as a multiplication (or 'one to two') problem'. This should focus our attention on a widely overlooked question: the metaphysical relationship between the developing embryo/fetus and its pregnant maternal organism.¹ The usual way of approaching 'coming into existence' questions does not consider this question, promoting an exclusive focus on the intrinsic features of embryo/

¹ See also E. Kingma, 'Were You a Part of Your Mother? The Metaphysics of Pregnancy', *Mind* (forthcoming).

fetuses instead.² But that loses sight of something significant: the ‘coming into existence’ of humans and other mammals does not happen in a vacuum, but occurs in what, for now, we shall call *intimate intertwinement* with another organism: the maternal organism. As this paper will make clear, losing sight of the gestational context of mammalian development is not trivial; at least on some understanding of the organism, taking account of the relationship with the maternal organism is *necessary* for arriving at a correct answer about our coming into existence.

Second, I focus on *organisms*, rather than on persons, humans or individuals. This allows us to consider answers without having to consider divisive questions about personal identity or ontology. It also has the distinct advantage of allowing a unified treatment of all mammalian reproduction,³ the vast majority of which – or so most people seem to presume – is not intimately connected to the reproduction of persons. Thus, although the core focus in this paper is on organisms of *Homo Sapiens* (and the details of embryogenesis taken from that species⁴), I invite the reader to constantly remind themselves that this paper should also apply to, say, gorillas, mammoths, mice, bats, and seals. I also invite the reader to remind themselves that a metaphysical claim about organisms does not, in itself, licence moral conclusions, or indeed claims about persons, in the absence of significant further moral or metaphysical assumptions that require independent defence.

² See e.g. G.E.M. Anscombe, ‘Were You a Zygote?’, *Royal Institute of Philosophy Lecture Series* 18 (1984): 111–115; David S. Oderberg, ‘The Metaphysical Status of the Embryo: Some Arguments Revisited’, *Journal of Applied Philosophy* 25 (2008): 263–276; E. Olson, *The Human Animal: Personal Identity Without Psychology* (Oxford University Press, 1997); J. McMahan, *The Ethics of Killing: Problems at the Margins of Life* (Oxford University Press, 2002).

³ To be precise: Placental reproduction. Placentals are the subset of mammals that have prolonged placental pregnancies, to be contrasted with marsupials (e.g. wombats) and monotremes (e.g. platypus). I use mammal to mean ‘placental mammal’ throughout the paper.

⁴ Note that there although embryogenesis is similar and remarkably robust amongst placental mammals (indeed amongst all vertebrates), there are relevant differences. Humans mostly have singleton pregnancies, for example, whereas many other mammals do not. Placental physiology also shows considerable variation. If this affects my arguments then my claims are restricted to human mammals and other mammals with sufficiently similar placental physiology.

What, then, is the relationship between the embryo/fetus and the pregnant organism? I shall argue that the embryo/fetus is not merely contained by or inside the maternal organism, but is a part of that maternal organism: fetuses are, literally, Lady-Parts.

There is more than one way in which one could argue this claim. In ‘Were you a Part of Your Mother’,⁵ I contend the point by applying criteria for organisms frequently employed in the philosophy of biology literature. In this paper I apply a substance metaphysics conception of the organism, developed by Barry Smith and Berit Brogaard.⁶ I neither defend nor endorse their framework. But exploring its application is relevant because Smith and Brogaard explicitly connect questions about fetal parthood with questions about our beginning. This usefully introduces the two options which I explore: either human organisms begin at birth, or human organisms can be part of other human organisms.

In section one I explain the metaphysical framework and analysis that Smith and Brogaard offer. In section two I explain their argument that fetuses are *not* part of the pregnant organism. In response I argue, using their own criteria for topological connectedness, that fetuses – just like kidneys, blood or hair – are a part of the maternal organism up until birth. In section three and four I spell out the dilemma that the part–whole claim results in, and its implications: either organisms start no earlier than birth (section three), or we must radically revise our pre-theoretical conception of organisms in order to recognise that mammalian organisms can be part of other organisms of the same kind (section four).

Terminology

Before getting into the argument, note two bits of terminology: the *foster* and the *gravida*. The *gravida* is simply a shorter term for ‘pregnant organism’, based on the Latin designation in medical casenotes. The *foster* is a Danish term that I borrow from Smith and Brogaard,⁷ and which I stipulate denotes what the gravida is pregnant *with*,

⁵ E. Kingma, ‘Were You a Part of Your Mother? The Metaphysics of Pregnancy’.

⁶ Barry Smith & Berit Brogaard, ‘Sixteen Days’, *Journal of Medicine and Philosophy* 28 (2003): 45–78.

⁷ Ibid.

regardless of its developmental stage. Thus zygotes, morulas, embryos and fetuses are all referred to in the shorthand *foster*.⁸

1. Smith and Brogaard on the metaphysics of organisms

Barry Smith and Berit Brogaard argue that fosters are *not* part of the gravida in the context of an elaborate framework on biomedical ontology developed by Smith and colleagues.⁹ Their argument is a small part of a larger argument that attempts to determine uncontroversibly when a mammalian organism starts. Smith and Brogaard characterise organisms as topologically connected, persisting, physical *objects*, that exhibit certain necessary properties: an organism, they write, is a *substance* in the Aristotelian sense: a ‘three dimensional spatially extended entity, which exists *in toto* any time it exists at all’.¹⁰ Substances meet six conditions: they (1) can undergo changes; (2) must either stay numerically the same substance or cease to exist; (3) can have spatial parts some of which can be added, lost and changed over time; (4) have a complete, connected external boundary which separates it from other substances; (5) are internally connected; and (6) are independent entities.¹¹ Organisms are those substances that meet four additional criteria, which identify them as unified causal systems that are relatively causally isolated from their surroundings: (7) it has an exterior membrane that (9) serves as a barrier; (8) it depends upon the maintenance of an internal climate that falls within a limited range of values;¹² and (10) it has mechanisms to reestablish and maintain that internal climate, and thus itself.

Smith and Brogaard maintain that everything that ‘satisfies conditions 1–10 [...]’, is of human decent and a product of normal fetal

⁸ I do not want to suggest that ‘foster’ is a morally or even metaphysically unified category; there are many relevant and interesting differences between zygotes, term-fetuses and the many stages in between. But for the purposes of this paper, i.e. investigating the relationship between the foster and gravida *during* pregnancy, they can be collapsed into one category (though with a possible exception for pre-implantation – see note 18).

⁹ Barry Smith & Berit Brogaard ‘Sixteen Days’. See listings on <http://ontology.buffalo.edu/smith/>

¹⁰ Barry Smith & Berit Brogaard, ‘Sixteen Days’, 47.

¹¹ In the sense that they do not require other entities as their ‘bearers’ or ‘carriers’, such as a smile which needs a face to bear it.

¹² This criterion bears a strong resemblance to traditional ideas of homeostasis.

development, is a human being'.¹³ Because there is little in their account that is specific to humans, we can modify their statement to 'everything that satisfies conditions 1–10 above and is of mammalian/*species x* decent and a product of species-normal development, is a mammal/member of *species x*'.

With this account of the organism in place, Smith and Brogaard go on to explain when a human organism begins according to their framework. It is in this context that their argument against fetal part-hood emerges.

1.1. Substance formation and start of the organism

When does a mammalian organism begin? Smith and Brogaard answer: when the process of *gastrulation* starts, sixteen days after conception. Gastrulation marks a substantial change, according to Smith and Brogaard, because during that process the pre-embryo 'ceases to be a cluster of homogenous cells and is transformed into a single heterogeneous entity – a whole multicellular individual living being which has a body axis and bilateral.'¹⁴ In other words, Smith and Brogaard maintain that human beings do not start *earlier* than gastrulation, because prior to that process, the cells in the blastocyst are not yet specialised in a way that mark them out as part of a larger contained whole. Thus they do not yet depend on each other in the right way to meet criteria 7–10: forming a unified causal system.¹⁵

What is relevant to this paper, however, is Smith and Brogaard's argument that human beings cannot start *later* than gastrulation. For this they provide two reasons. The first is *intrinsic* to the foster: any further changes after gastrulation – such as neurulation, the acquisition of organs, hands, feet, etc. – they argue, are not substantial changes that change the foster into a new substance, but changes that the foster undergoes *as* a unified causal system and human being (criterion 1). The second, which is what concerns us, is *extrinsic* to the foster: Smith and Brogaard consider but emphatically reject the idea that the foster is part of the gravida. Birth, they claim, is *not* a substantial change, but *merely* a transition 'from one environment

¹³ Smith & Brogaard, 'Sixteen Days', 51.

¹⁴ Ibid., 62

¹⁵ Oderberg argues, I think correctly, that differentiation and causal unity actually precede gastrulation. I add support to this point at the end of section four (David S. Oderberg, 'The Metaphysical Status of the Embryo: Some Arguments Revisited').

into another', like an 'astronaut leaving her spaceship'.¹⁶ What is their argument? And is it convincing?

1.2. The tenant–niche claim

Smith and Brogaard argue against the view that the foster is part of the gravida by invoking the concept of a *niche*. A *niche* 'is a part of reality into which an object fits, and into and out of which the object can move'.¹⁷ Smith and Brogaard maintain that substances *s* can be inside other substances *S*, without being part of *S*, iff *S* contains a *niche* that contains *s* as an occupier or *tenant*. Gravidae, Smith and Brogaard argue, contain a niche of which the foster is a tenant. Therefore – appearances notwithstanding – fosters are not a proper part of the maternal organism, but instead substances in their own right.

Let's evaluate that. Can a foster move in and out of its niche, the way Smith and Brogaard claim a tenant supposedly can? What a preposterous idea. We cannot take 'the bun out of the oven', check it, and stick it back in if it is not fully cooked. (If only!) Birth is irreversible: once a baby is out, it does not go back in – ever. In fact, nobody has even successfully transplanted a foster,¹⁸ and even if we *did* gain that technology, that would not change things. Consider hearts and kidneys; although we have the technology to transplant these, that does not stop us from considering them parts rather than tenants. These organ transplants are possible, but they are exceedingly difficult and risky – and that is precisely *because* they remove and insert parts of organisms which involves severing major connections. The same will apply should we be able to transplant fosters.

It is clear that, on Smith and Brogaard's initial formulation of the tenant–niche relation, fosters and gravidae do not stand in a tenant–niche relationships. But, Smith and Brogaard do not discuss this initial formulation when discussing the foster. Instead they posit three further characteristics for the tenant–niche relationship that they claim *do* apply to fosters. These are that niches and tenants (1) do not *overlap* or have parts in common, (2) do not

¹⁶ Smith & Brogaard 'Sixteen Days', 65.

¹⁷ *Ibid.*, 70. See also Barry Smith & A. Varzi, 'The Niche', *Nous* 33 (1999): 198–222.

¹⁸ After implantation, that is. Before implantation this is a different matter, as IVF illustrates. If and how the arguments apply prior to implantation will have to be addressed another time.

share an external boundary, and (3) must be separated from each other by some liquid or fluid-filled cavity. As an illustrative example, consider a fish inside an aquarium. Although the fish is *inside* the aquarium it is not *part of* the aquarium; rather it is a tenant in a niche. Not only because fish can be moved in and out of the aquarium, but also because (1) fish and aquarium do not share parts; (2) fish and aquarium do not share an external boundary; and (3) fish are in a [water-filled] cavity in the aquarium.

Based on these criteria, Smith and Brogaard give two arguments to convince us that fosters are tenants in a niche. First, and corresponding to the second criterion, they assert that a foster has its own, completely connected external boundary, marked by a physical discontinuity between foster and grávida; the foster is at no point topologically connected to the grávida. Second, and corresponding to the third criterion, they focus on the role of the amniotic cavity as ‘surrounding’ the foster.

1.3. Testing the ‘tenant–niche’ claim: boundaries

Let’s assess whether, despite their not meeting the initial formulation of the tenant–niche relationship, fosters should be considered a tenant in a niche according to these new arguments and additional criteria. But before this assessment can be executed, we need to have two further bits of information. First, we must know what the *boundaries* of the foster are that the tenant–niche criteria repeatedly refer to. Second, we must understand the concept of a *fiat boundary*.

What are the boundaries of the foster? The answer to this question is less than straightforward, and this is not something that Smith and Brogaard are explicit about. Rather than giving a definite answer, I will identify the three most plausible candidates for delineating a foster. Instead of picking one, I will argue for each of them that Smith and Brogaard’s arguments and criteria don’t apply, and thus that the foster fails to be a tenant in a niche. These three conceptions of the foster are:

- 1) ‘*Future Baby*’ (FB), where the foster only comprises the parts that emerge as the future baby: the (future baby’s) body, circumscribed by its skin and stopping at the umbilicus or some way along the umbilical cord;¹⁹

¹⁹ Oderberg notes that in discussions of the metaphysical status of fetuses it is conventional to take the *future baby* view of the foster (he calls

Elselijn Kingma

- 2) ‘*Baby with Placenta*’ (BP), where the foster comprises the ‘future baby’ plus the umbilical cord and placenta;
- 3) and the ‘*Chorionic Content*’ (CC), where the foster comprises future baby, umbilical cord and placenta, as well as the chorionic and amniotic membranes and all their contents, including e.g. amniotic fluid.

Before I can examine these three conceptions, it is helpful to understand Smith and Brogaard’s concept of the ‘fiat boundary’:

‘Fiat boundaries are boundaries that correspond to no underlying physical discontinuities. Examples are found above all in the realm of arbitrarily demarcated geospatial entities such as postal districts, census tracts, or air traffic corridors.’²⁰

As an example, the closed door to my office marks a real or *bona fide* boundary between my office and the hallway; when I open my door there is merely a *fiat* boundary between office and hall.

Smith and Brogaard’s core arguments in favour of the fosters’ tenant–niche relationship to the gravida rely on the existence of actual, clear and complete external boundaries. As they themselves state: ‘if the foster is connected to the mother – if, in other words, the boundary between the foster and the mother is a matter of fiat and not of bona fide boundaries – then the foster cannot stand to the mother in the niche-tenant relation’.²¹ As the most expedient way of repudiating their claim to about fosters being tenants, then, I will demonstrate that for each conception of the foster its supposed boundary very clearly is one that incorporates a section that is merely a *fiat boundary*.²²

First, consider the *Future Baby* conception, where the foster has a boundary at the umbilicus or a bit further along the umbilical cord. During pregnancy, this clearly marks a *fiat boundary*; a physical discontinuity will only appear once the umbilical cord is severed after

it the *fetus proper*). But, he says, there is nothing inconsistent about taking something like the *chorionic content* or *baby-with-placenta* view (‘The Metaphysical Status of the Embryo: Some Arguments Revisited’).

²⁰ Barry Smith & Berit Brogaard, ‘Sixteen Days’, 72. See also Barry Smith & A. Varzi, ‘Fiat and Bona Fide Boundaries’, *Philosophy and Phenomenological Research* 60 (2000): 401–420.

²¹ Smith and Brogaard, ‘Sixteen Days’, 73.

²² For a more detailed version of this argument, see Kingma, ‘Nine Months’, *Journal of Medicine and Philosophy* (Revise and Resubmit).

birth, but does not exist during the pregnancy. The umbilical cord is a clear example of topological connection, and moreover one that marks a functionally and metabolically essential connection. On the *Future Baby* view, the foster does *not* stand in a tenant–niche relationship to the gravida.

Second, consider the *Baby with Placenta* conception. Here the foster has a boundary at the maternal side of the placenta: somewhere inside the spongy maternal deciduous tissue – perhaps at the rough site of the placenta’s future separation. This, again is a *fiat boundary*; after birth, the placenta will detach and there will be a physical discontinuity between placenta and the (previously) pregnant organism. But before birth, there is no boundary here; the placenta is not a clearly defined mass with a smooth surface surrounded by a membrane the way that brains, kidneys or lungs are. Instead, the placenta comprises tissues of maternal and fetal origins and grows direct into (or out of) the uterine wall, just as a tail grows out of the cat. The interface between placenta and the womb is best thought of as a zone, and a zone that is not only marked by the intermingling of fetal and maternal tissue, but also traversed by not one but *many* functionally and metabolically essential arteries and veins over a large surface. In other words, the placenta is the hallmark of topological connection. A further testament to this is that the wound created upon placental detachment, despite its being a planned and functional biological event, is of such severity that even in our modern age of blood transfusions, it is one of the main causes of maternal death. On the *Baby with Placenta* view, the foster is not a tenant of the gravida.

Finally, on the *Chorionic Content* conception, the foster still has a *fiat boundary* on the maternal side of the placenta, just as it does on the *baby with placenta* view. For the placenta is part of – and in a sense even outside – the chorion. This view, then, inherits the problem of the *baby with placenta* view: on the *Chorionic Content* view, the foster is not a tenant of the gravida.

On none of the plausible conceptions of the foster does the foster stand in a tenant–niche relation to the gravida. On each of these views, the boundary of the foster involves a ‘fiat boundary’ – a boundary that is not marked by a physical discontinuity, but recognized by us for other reasons. The existence of fiat-boundaries mean that the three additional criteria of standing in a tenant–niche relation are not met: foster and gravida *do* share overlapping parts (either at the level of umbilical cord, or at the level of the placenta/uterine wall); they share an external boundary at these locations; and they are not fully (but only partially) enveloped by a fluid-filled cavity. Nor do

Smith and Brogaard's two arguments, which rely on a complete external boundary, marked by a physical discontinuity, and on the 'surrounding' of the foster by a fluid-filled cavity, apply. The foster does *not* have its own, completely connected external boundary, that is marked by a physical discontinuity between foster and grávida; instead the foster is very clearly topologically connected to the grávida at the locus of umbilical cord or placenta, just like a tail is to a cat, your testes to your body, or your kidney to the rest of the organism. Second, the amniotic cavity only partially 'surrounds' the foster, which remains topologically connected via a 'stalk'. Partial surrounding with stalk-connection can *not* be the sign of tenant–niche status; such morphology is entirely common in mammals: hearts, lung, kidney, brain, pancreas, intestines, and so on are all suspended in fluid filled cavities, but connected by a 'stalk'.

To conclude, either foster and grávida do not stand in a tenant–niche relation – meaning that instead fosters are part of grávidae – or Smith and Brogaard must have had another conception of the foster in mind than the three I just outlined. Such a conception of the foster – that is free of fiat boundaries – would have to delineate the foster in such a way that no boundary is drawn anywhere between umbilicus and uterine wall. I, for the life of me, cannot imagine what such a conception would be – but I am open to suggestions.

1.4. Interim Conclusion: the part–whole claim

I have repudiated Smith and Brogaard's argument *against* the part–whole claim: if we take an actual look at physiology, fosters, despite their assertions, do not meet any of their own criteria for being a tenant in a niche. On these grounds I conclude that fosters are part of their gestating organisms, until birth.

Where do we go from here? Rather than accept the part–whole claim, one could reject Smith and Brogaard's specific account of the organism, and look for alternatives. That is beyond the scope of this paper. Even so, we should not assume that other accounts of the organism will easily avoid the present conclusion. The kind of considerations uncovered in this paper, i.e. the intermingling of fetal and maternal tissue at the placenta, the lack of clear boundaries between foster and the rest of the grávida, the sharing of the placental organ, and the evidence of the foster being firmly knitted into the grávida's physical body and metabolic systems, all give evidence that speak in favour of the part–whole claim directly, and may well do so on a range of plausible considerations of the organism.

Indeed, I argue in ‘Were You a Part of Your Mother?’²³ at least a first gloss of existing accounts of the organism in the philosophy of biology points firmly towards the claim that the foster is part of the grávida.

If we accept the part–whole claim, what implications does that have for the question of our coming into existence, on an account such as Smith and Brogaard’s that connects these questions?

2. Metaphysics of Organisms: Beginning at Birth

At least on the face of it, mammalian organisms are individuals: self-standing entities that are distinct from each other. Mice are not normally problematically overlapping with other mice, nor do we ordinarily think that there are mice that are part of other mice. If we accept and commit to this intuitive view of the organism, where organisms can’t be part of other organisms *of the same kind*,²⁴ and combine it with the part–whole claim, then mammalian organisms begin at birth, and no earlier. Formally:

(P1) an organism cannot be part of another organism. [Intuitive Claim]

(P2) fosters are part of another organism (grávida). [Part–whole Claim]

=> (C1) fosters cannot be organisms

Smith and Brogaard appear to endorse precisely such an intuitive view of organisms through their claim that substances cannot be part of other substances.²⁵ So, by their own criteria, they are committed to a ‘beginning at birth’ view. Contrary to their claims, birth *is* a substantial change: at birth fosters cease to be and new substances –

²³ E. Kingma, ‘Were You a Part of Your Mother? The Metaphysics of Pregnancy’.

²⁴ It is less controversial that organisms can be part of other organisms of a different kind Robert A. Wilson & Matthew Barker, ‘The Biological Notion of Individual’, *The Stanford Encyclopedia of Philosophy* (Spring 2014 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/spr2014/entries/biology-individual/>>.

²⁵ See e.g. Smith & Brogaard, ‘Sixteen Months’, 47, criterion 4: ‘Substances are distinguished, [...] from the undetached parts of substances. The latter can become substances, but only through becoming detached.’ This they reassert e.g. (53) ‘We might attach a new tail to a tailless cat. Before the attachment, cat and tail are separate substances. As a result of the attachment, what had been a separate substance is now a part of the cat.’

baby-organisms – come into existence. And human beings do not begin 16 days after conception but, usually, nearly eight-and-a-half months later: at birth.

2.1. *Attractions*

The view that human and other placental organisms start at birth is not, I suspect, immediately appealing. But it does have some attractions. First, it is numerically neat; it is clear how we count organisms. Second, it ties coming into existence to a clear and specific *event* – birth. This saves us the notoriously difficult and divisive problem of trying to pinpoint an occasion in or impose a dichotomous classification on what is in fact a very slow and gradual but – overall – massively transformative process: conception to embryogenesis to gestation to birth. Third, it is consistent with our intuitive, non-messy view of mammalian organisms in which they are much like we thought they were: clearly demarcated, physically separate individuals from start to finish.²⁶ Fourth, it marks out birth as a substantial change. This is attractive because it emphasizes and preserves something that, I submit, too many other views, including popular representations and ordinary language – which often refers to both fosters and babies as ‘babies’ – too easily gloss over (a mistake also made by Smith and Brogaard): birth is a much more substantial event than a mere change of environment, and fosters are not simply ‘babies in tummy’s’; there are many differences (internal, structural, functional, relational and topological) between fosters and babies.²⁷

²⁶ And this is precisely the attraction of *having* the concept of an organism. In other parts of biology, such as plant biology, the concept becomes much less useful as the distinction between different organisms becomes exceedingly fuzzy. In fact the very question whether ‘organism’ is a useful biological category is a live one (Matt H. Haber, ‘Colonies are Individuals: Revisiting the Superorganism Revival’, in F. Bouchard and P. Huneman (eds), *From Groups to Individuals: Evolution and Emerging Individuality, The Vienna Series in Theoretical Biology* (Cambridge, MA: MIT Press, 2013)). If the concept is to make sense *anywhere* however, the best candidates are mammals and other complex, multicellular animals such as birds, reptiles and fish.

²⁷ Babies, for example, breathe, scream, oxygenate their blood in their lungs, have close to 100% oxygen tension in their arteries and use their heart as a dual-pump maintaining separated somatic and pulmonary circulations. They also stop at the umbilicus. Fosters, by contrast, use their heart as a single pump, have much lower oxygen tension in their arteries (and, as a

2.2. Drawbacks

Even so, the view that organisms start at birth appears to have clear drawbacks. First, it denies that (human) fosters are (human) organisms. Some may be tempted to draw quick moral conclusions from this finding. But I repeat my earlier caution about moral inferences from metaphysical premises. This only seems a drawback if, for example, one believes all of our moral attitudes towards fosters must depend on their being organisms, or if one believes that all parts of our body must be morally similar. Both beliefs need defence. We have no reason at this stage to think that all relevant moral attitudes must track only organisms rather than organisms *and* fosters. Nor do we have reason to think that all parts of organisms demand the same moral attitude: kidneys and hairs are both parts of organisms, but very clearly deserve different moral and practical attitudes; there is no reason to think fosters wouldn't demand different moral attitudes again. In fact – clearly they do.

Second, a drawback of the view is that it seems so incredibly counterintuitive. It states that the foster does not survive birth, and baby is not the same as the foster that existed seconds before. Because substantial changes block numerical identity on Smith and Brogaard's metaphysics,²⁸ and birth is a substantial change, at birth the foster *must cease to exist*. But that seems unacceptable. Surely a baby does not come into existence out of thin air? Surely the *cut* of the umbilical cord did not create a human being where there was none before? And on the flipside, what *happened* to the foster? Did it vanish? Or, if not, where is the corpse?

Such a response, however, misunderstands Smith and Brogaard's ontological view. Substances don't vanish into thin air or defy laws of nature by being conjured up out of nothing. Rather, matter persists to become a different substance; a different *thing*, when it undergoes substantial change. The house (a substance) ceases to exist when it falls apart into a collection of new substances: a pile of rubble. Thus the house *becomes* a pile of rubble, but is not numerically

consequence, look more purple than red), and may have an entire extra organ that the baby lacks: the placenta.

²⁸ Note that the numerical identity block only applies to the foster; this is not, or at least not obviously, a problem for the gravida. Organisms survive changes including the loss and gain of bits all the time, therefore that the gravida loses parts – kidneys, ova, hair, menstrual discharge and fosters – is not itself an immediate threat to her survival.

identical to a pile of rubble. Similarly, one amoeba ceases to exist when it splits into two new substances: two (new) amoebae. But it is not numerically identical with either or both of them, nor does it leave a corpse. And – to use Smith and Brogaard’s earlier claim – a collection of cells, which presumably is a collection of substances, coheres at gastrulation to form a new substance (or so they claim): an embryo. The embryo, on their view, is not numerically identical with the collection of cells. In all these cases there is no corpse – and nothing was conjured up out of thin air. Matter persists, but it instantiates different substances, and substance(s) were transformed into other substance(s).

Although reading the claim in such a context takes away some of the counter-intuitiveness, I don’t think it is quite satisfactory. For the worry is not just that it is strange that fosters vanish and babies appear out of thin air – which is a worry we can now set aside – the worry is also that the baby, intuitively, seems to be numerically identical with the foster. Surely newborn babies were fetuses only seconds before? Surely the new mother is holding in her arms the very *thing* she was pregnant with? And surely dolphins gestate dolphin-organisms that then come out as dolphin-babies? Indeed many philosophers are explicitly committed to the view that (human) organisms were once fetuses.²⁹ The beginning at birth view is committed to denying this.

There are two ways of getting around this worry. One is to claim that this intuition in fact tells us that the *human being* or *person* persists, and then to deny that the human being is an organism. For example, one might think that the foster is not numerically identical to the baby, but that the *human being* that is first, say, constituted by or co-located with the foster, and then constituted by or co-located with the baby, persists throughout. But not only does such a view invite objections to the metaphysics involved,³⁰ it is simply not plausible that that is what drives the intuition. Remember that we are talking about all mammals here; surely a mouse baby was a foster just as much as a human baby is.

Second, one might attempt to get around the worry by thinking that ‘organism’ is not a substance-sortal, but a phase-sortal, like ‘puppy’ or ‘adult’. Thus, just as my dog has been the same individual throughout its life, but went from being a puppy to an adult to an

²⁹ See e.g. E. Olson, *The Human Animal: Personal Identity Without Psychology* (Oxford University Press, 1997).

³⁰ See e.g. E. Olson, *What Are We? A Study in Personal Ontology* (Oxford University Press, 2007).

elderly dog, it went from being a ‘foster’ to being an ‘organism’ at birth. But that clearly fails to capture the spirit of Smith and Brogaard’s view. They identify themselves as substance metaphysicians, giving an account of organisms *as* substances, and very clearly indicating that they are interested in the coming-into-existence of the *thing* ‘human organism’.

Even so, one might think that this captures something else: the spirit of what we are after more generally. We do *want* to track and recognize the thing that *does* appear to persist during birth, whatever that is: the thing that *was* a foster before and is a baby now; the thing that people adoringly look at on a prenatal scan and whose picture they nowadays share as their *baby’s* first picture. Might we, then, consider modifications to the account of the organism that Smith and Brogaard offer so that we recognise that the foster and baby are the same thing – the same individual offspring? I think we should.

3. Revised Metaphysics: Organisms as Persisting Organism-Parts

In this section I consider what happens if we revise Smith and Brogaard’s metaphysical framework such that we can combine the part–whole view with a commitment to the idea that baby-organisms were once fosters. This avoids the counterintuitive implication that mammalian organisms cannot start before birth, but only at a cost: we have to accept a different counterintuitive implication instead, which is that organisms can be part of other organisms of the same kind. This is why the part–whole claim presents a dilemma.

3.1. Revising Smith and Brogaard’s account

Can we revise Smith and Brogaard’s account of the organism such that a substance survive the transition from being a part to no longer being a part? Whether substances can or cannot be part of other substances is a live subject of debate – and I cannot cover the relevant general metaphysical arguments here.³¹ But at least one

³¹ See e.g. Kathrin Koslicki, ‘Substance, Independence, and Unity’, in E. Feser (ed.), *Aristotle on Mind and Metaphysics* (Palgrave MacMillan, 2013), 169–195; Patrick Toner, ‘Independence Accounts of Substance and Substantial Parts’, *Philosophical Studies* 155 (2010): 37–34.

reason why this might be explored is the following: although Smith and Brogaard's explicit criteria make it very clear that substances can't be part of other substances, other parts of their article are not consistent with that and suggest that parts of substances *can* be substances in their own right.³² Perhaps, then, the idea that substances can be part of other substances was on their mind all along.

I propose the following revisions to Smith and Brogaard's account of the organism:

- (2) A substance *cannot* be a part of another substance/organism becomes
- (2*) A substance *can* be a part of another substance/organism

In addition, if fosters are to be organisms/substances, the following criteria will have to be dropped:

- Criterion 4 (having a complete external boundary);
- Criterion 7 (external membrane)

But further modifications are necessary still. Some criteria are only met by fosters to a rather limited degree; fosters certainly depend on internal homeostasis (8), but they can do relatively little to maintain it: temperature, for example, is regulated by the grávida. Similarly, some membranes in fosters protect it against some causal influences (9) – but so do membranes in our body everywhere. Consider for example the blood-brain barrier, or membranes between organs and peritoneal cavity. The true protection for fosters against the outside world, however, is the maternal skin. Finally (10) mechanisms for self-repair and re-balancing are limited: no foster can repair the amnion, placental rupture tends to be fatal, etc – and throughout it all the foster crucially depends on

³² Smith and Brogaard's original justification for adopting the 'no-niches' condition on parthood was the need to exclude organs from being human organisms. ('For consider John's heart. This is a substance, and it is a relatively isolated causal system; it is non-divisible; and it is a product of human reproduction; yet it is not itself a human being because it is not a maximal entity satisfying these conditions: it belongs as proper part to John's organism as a whole.' 'Sixteen Months', 68). That is surprising because on their own criteria, involving complete external boundaries, human organs were never candidates for being either substances or organisms in the first place. What this may indicate is that Smith and Brogaard had a more liberal interpretation of external boundaries and substances in mind all along – though I am not sure what that interpretation would amount to.

continued ‘support’ of the gravida. Therefore, these criteria have to be toned down.

These revisions, however, come at a cost. First, we have to significantly revise our pre-theoretical concept of organism – and, with that, some of the virtues that that concept had. Second, it becomes difficult to distinguish organisms and organs, and, third, it is even less clear when organisms start, or what their boundaries are.

3.2. Counting Problems

One advantage of the traditional view of individuals is that they are countable. And the unrevised view of organisms, where organisms start at birth, makes for straightforward counting indeed – as we recognise throughout our social and legal practices. The revised metaphysics, by contrast, may create counting problems. In *Sameness and Substance*, David Wiggins writes of the pope’s crown (which consists of three crowns): ‘there is no universally applicable definite way of counting crowns. [...] There is no definite answer, when the Pope is wearing his crown, to the question “how many crowns does he have on his head?”’³³ If Wiggins is right, about crowns, then the same may apply to pregnant organisms: there is no definitive answer to the question (when pointing at a pregnant organism at any point in her pregnancy): ‘how many organisms are there?’ This means that there is no definite answer, at any point in time, to the question: ‘how many human organisms exist right now?’ That seems, at the very least, unattractive.

3.3. Distinguishing organs and fosters

A second problem is that, with restrictions on parthood and complete external boundaries gone, it is not longer just fosters that meet the ‘new’ criteria for being an organism; organs are too. Take, for example, a kidney. A kidneys (1) can undergo change (2) must stay numerically the same or cease to exist (3) has spatial parts, [(4) like the foster *doesn’t* have a complete external boundary], (5) is internally connected, (6) is an independent entity,³⁴ (7) like the foster, is mostly

³³ David Wiggins, *Sameness and Substance* (Cambridge MA: Harvard University Press, 1980), 73.

³⁴ In the sense relevant here – as not requiring something else to instantiate its existence as a smile is instantiated by a face.

(but not completely) covered by an external membrane that (9) serves as a (sort of) barrier to the rest of the organism,³⁵ (8) depends to a degree on internal homeostasis that it has some role in maintaining,³⁶ but also depends on the rest of the organism for this, and (10) engages in some self-repair.³⁷ In fact it is not just organs that are organisms on the revised criteria; all sorts of bits of our body seem to be candidates for meeting these criteria, depending on how strictly we apply them: e.g. muscle fibres, fingers, lymph nodes, tongues, the aorta, liver or pancreas lobes, glomeruli, etc. – and even individual cells.

If the revision of these criteria was motivated by the desire to create a more intuitive concept of organism that includes fosters, then this change is hardly successful; that desire is not adequately met by a concept that includes all sorts of human body-parts as human organisms.

How might the criteria be further revised to distinguish between fosters and organs such that the former but not the latter count as organisms? First, one may attempt to distinguish organs and fosters on the grounds that the latter are not essential to the functioning of the larger organism, whereas the former are. That does not work for two reasons. First, fosters are essential for ensuring the reproductive functioning of the grávida; if we respond by arguing that reproductive functioning is not essential, than not only would fosters be organisms and not organs, but so would testes, the ‘*corpora cavernosa*’ of the penis (responsible for erections), testicles, ovaries, the uterus – and so on. Second, very many muscle fibres, cells and other body bits are not essential; we have a lot of over capacity in various places, including in our kidneys (one is essential – two are not).

Second, one might attempt to distinguish fosters and organs on the grounds that only fosters but not organs can become substances in

³⁵ E.g. the kidney has membranes that serve as a barrier to the peritoneal cavity; the brain has membranes that protect it from impact as well as from various chemicals in the blood that cannot traverse this membrane, and so on. Smith & Brogaard (‘Sixteen Months’, 52): ‘The heart and lungs, too, are separated from each other by appropriately constructed membranes (pericardium, pleura), which shield the processes occurring within them from outside influences.’

³⁶ Parts of kidneys and other organs, for example, locally regulate vasodilation and vasoconstriction. Human testes have their own temperature regulation mechanism, keeping the sperm at a considerably lower temperature than the rest of the body.

³⁷ Organs also have local mechanisms for replacing cells, membranes and other damage – and even considerable abilities of regeneration (e.g. liver).

their own right. But that fails because kidneys, spermatozoa, milk teeth and hair can all become substances in their own right. One might retort that only fosters, but not organs and other body-parts *normally* become substances. But although that works for kidneys, it does not work for milk-teeth, spermatozoa, hairs, skin cells, cells lining the uterus, etc. – all of which also normally become substances.

Third, one might attempt a distinction on the grounds that fosters but not organs and other body-parts are disposed to become self-standing organisms – or organisms that are also substances. But that at the very least requires more work. First, it is question-begging: if teeth are organisms, on this view, then they are disposed to become self-standing organisms. Second, what about the fosters that in fact aren't disposed to become adult organisms, for example because they lack the capacity to grow beyond a certain point or will certainly not survive birth? And what about the fosters that would have – or would never have – become substances had it not been for medical technology, and/or the mother's exercise of her free will? Thus at least one reason why this position is not easy to cash out is because of the problems of defining 'normal' in biology.³⁸

I do not rule out that we could have a set of criteria that could successfully discriminate between organs and organisms, and thus between organs and fosters – and a sophisticated version of the third option seems most promising. But such an account needs developing.

3.4. *When do fosters begin?*

A third issue that remains to be settled is what the spatial and temporal boundaries of the foster are. On Smith and Brogaard's original statement that was already unclear; I noted at least three competitors in the previous section: e.g. the future baby view, the baby-with-placenta view, and the chorionic content view. But the unclarity and the possibilities only increase on the revised criteria. Without purported complete external boundaries to do the delineating work, for example, it is not at all clear where *gravidae* would end or fosters start; whether *gravida* and foster would not end up having more overlapping parts with, for example, more elements of the mother's

³⁸ Does it mean 'uninterfered with by humans?' (in which case, what about IVF? And what about the fact that all human conceptions involves two adult humans 'interfering' with each other?); does it mean 'without technology'? Does it mean 'statistically normal'? Etc.

anatomy/physiology seen as *also* part of the foster: parts that it loses upon its birth.

This also re-opens a question that had supposedly been settled: when do fosters begin? One might think that question has been answered; with constraints on maximality and complete external boundaries gone, surely it must be Smith and Brogaard's original answer: 16 days after conception. But since the criteria for organisms have now changed, we cannot take that answer at face value – and I shall argue it is incorrect.

Why? Consider the reasons Smith and Brogaard identified gastrulation as the earliest start of the organism. This was because – they argued – only at gastrulation did the start of cell differentiation and lack of splitting possibilities mark out the foster as a 'single heterogeneous entity'³⁹ or a unified causal system. But in doing so, Smith and Brogaard simply assumed the 'Future Baby' view of the foster. Gastrulation is when the embryonic disk – the bit that will make the future baby's body – starts folding into a three-dimensional entity. Other parts of the zygote-derived entity, such as the trophoblast, starts differentiating much earlier, however; around 4–5 days after conception (i.e. just prior to implantation) the blastocyst has already differentiated the trophoblastic cells that help it implant in the uterine lining, and will later build part of the placenta. Thus, if we assume a different view of the foster, such as the 'baby with placenta' or 'chorionic content' view, then the blastocyst forms a 'unified causal entity' at least as early as 4–5 days after conception.⁴⁰

One might retort that the possibility of twinning⁴¹ counts against recognizing a persisting entity at this stage. And, indeed, Smith and Brogaard discuss this. But that – too – is no longer obvious. On a view where organisms can be part of other organisms, and where – as birth illustrates – organisms can have and lose parts that are or become organisms in their own right, it is no longer so obvious that the possibility of twinning undermines functional integration or blocks the existence of a human being. Indeed, it is not obvious that the possibility of twinning has any relevance to fetal metaphysics at all; on the revised criteria it is entirely normal for a

³⁹ Smith & Brogaard, 'Sixteen Months'.

⁴⁰ Oderberg makes a similar point (in 'The Metaphysical Status of the Embryo: Some Arguments Revisited').

⁴¹ See e.g. Anscombe, 'Were You a Zygote?'; Smith & Brogaard 'Sixteen Months'; J. Harris, *Clones, Genes & Immortality* (Oxford University Press, 1998).

organism to have a part that will or has the possibility of becoming a separate organism.

This suggests that, if we revise Smith and Brogaard's account so as to allow for the possibility that organisms are part of organisms, their criteria may locate its beginning much earlier than 16 days; as early as implantation or even a few days before – only several days after conception. But in the absence of a clear view on the boundary of the foster, it is difficult to tell for certain.

And the boundary of the foster will not be easy to delineate. Once a view allows that organisms are part of other organisms, things get messy (which is precisely one of the attractions of a view that does not allow for that option). Consider again the Future Baby View and the Chorionic Content view. Which one is the foster? Which one is the future organism? I don't know the answer, but I do know that once organisms can be part of other organisms, one might offer quite a few different views. Here is just that ordinarily we probably would not consider: the 'Future Baby-organism' is the organism that starts at 16 days and – hopefully – survives birth to die in ripe old age. The 'future baby' is part of a *second organism* – the 'chorionic content' organism – which starts a few days after conception with the differentiation of trophoblasts, and dies at birth. The 'chorionic content organism' is part of a *third organism* – the gravida – which preceded and – hopefully – survives birth. This view might solve one puzzle: mono-chorionic twins. On the view suggested one could argue that there is only ever one 'chorionic content' organism, that has two future baby-organisms as its parts. But I neither advocate nor defend this view; it is merely to illustrate the options that open up.

4. Conclusion

Time to sum up. This paper applied a substance ontological framework developed by Smith and Brogaard to questions about the relationship between fetus/embryo and maternal organism during pregnancy, and to the question when mammalian organisms begin. I first argued that the foster is topologically connected to the gestating organism via umbilical cord and placenta, and therefore a part of that organism. This repudiates Smith and Brogaard's claim that the foster stands in a 'tenant-niche' relation to the pregnant organism – as a fish does to its aquarium – and is therefore not a part.

This particular defence of the part-whole view of pregnancy on topological grounds can at this stage only be as strong as the

conception of the organism that it is grounded in. Nonetheless I think the interest and plausibility of the part–whole claim exceeds the merits Smith and Brogaard’s account. The physiological and spatial intertwinement of maternal organism and foster that was uncovered in this paper gives independent *pima facie* support to the part–whole claim. This concurs with further considerations I offer in ‘Were you a Part of Your Mother’,⁴² in support of the same view.

If the part–whole claim is combined with the question when we began, we are faced with two choices. Either we retain an intuitive, clear and non-messy view of what mammalian organisms are: clearly delineated, physically separate, relatively independent individuals. This is the sort of account of the organism that Smith and Brogaard offered. But such organisms can only begin at birth, which comes at a cost: it means giving up on the idea that fosters and babies could ever be one and the same persisting organism or thing.

Alternatively, we can hold on to the intuitive idea that organisms exist prior to, and survive, their birth. But then we have to give up on what now seems one of mammals’ central characteristics: their separateness. We would have to accept that it is a regular part of the mammalian – that is, human – lifecycle that mammals are part of other mammals. Such a change to our conception of the organism may have significant knock-on affects that need further investigation. I demonstrated this for Smith and Brogaard’s view; accepting that organisms could be part of other organisms did not mean, for example, that they could simply revert to their earlier answer about the beginning of the organism: 16 days. Instead it presented new challenges, such as distinguishing organisms from organs. It also pushed the onset of the organism further back – perhaps as early as four or five days after conception, depending on what we deem the spatial boundaries of the foster – which itself was called into question.

But the knock-on effects do not stop there. I noted that mammalian organisms, intuitively, were individuals: self-standing entities that are distinct from each other. I suggest that this view of human organisms underpins much of our metaphysics of persons and indeed our moral and legal practices. Accepting the view that human organisms can be part of other human organisms therefore may require significant revision not just to our idea of the organism, but to all these fields. For example, it is no longer clear that organisms and humans are always individuals in any relevant sense, or how the

⁴² Kingma, ‘Were You a Part of Your Mother? The Metaphysics of Pregnancy’.

notion of ‘individual’ is to be interpreted in a human organism that has another human organism as its proper part. Nor are organisms, on this view, always physically distinct from each other; they can be non-separate. We can also wonder what the implications are for the proper application, or even feasibility, of rights to bodily autonomy, privacy and non-interference of such revisions. Finally, we can wonder what view that organisms are part of other organism implies for personal identity and the relationship between gravida and future offspring.

These questions are not restricted to accepting Smith and Brogaard’s account of the organism. If the part–whole claim holds, then this affects *any* account of humans (or other placentals) that has the following two features: (1) it identifies us with, or we inherit the physical properties of, organisms or similar material objects; (2) it wants to preserve numerical identity between babies and fosters. Even views of the human on which we aren’t organisms or similar physical objects but merely co-locate or coincide with them, such as dualism, will have to take into account that the organisms through with we exercise our agency and engage with the world can be part of other organism.

Accepting the view that human organisms are part of other organisms should therefore not be done lightly, nor should it be done without investigating and committing to the further revisions that such a change requires. More simply, we either stick to talking about human organisms as we always took them to be – physically distinct individuals – which means they start at birth. Or we accept that human organisms can be part of other organisms, which means that we have but the loosest grip on what it means to designate something an organism; what properties it has; what inferences such a designation licences; or indeed exactly what it is we are talking about. What we cannot do, however, is continue to take organisms to be physically separate individuals and organise our moral and legal frameworks on the basis of that idea, and then – and only when it suits us – temporarily switch to employing a different view of organisms, on which they can be parts, without contemplating and committing to any consequences of that change; for example, when we are looking at a prenatal scan.

University of Southampton
E.M.Kingma@soton.ac.uk